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ABSTRACT

This report summarizes the findings of a study on stress management training in the modern office. It identifies the training needs arising from the modernization of the office environment and the consequent stress experienced by staff, reflecting both the experience of change and the demands of the information technology (IT) environment. The report is intended as a curriculum resource for designers of PICKUP (Professional, Industrial, and Commercial Updating) courses and for others who wish to provide more training in this area. Section 1 describes the changing office environment and introduction of IT. Section 2 is concerned with the general training needs associated with work in the modern office as identified through research or highlighted in literature. Section 3 discusses the nature of stress at work and proposes a model of stress in the modern office. It then explores the possible design of appropriate stress management programs. In section 4 some of the existing business and office courses are analyzed. The framework of a modern training program related to the management of stress in the modern office is suggested. Appendixes include a list of references, a list of selected recommended texts, an interview schedule, and a questionnaire. (YLB)

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CHANGE AND STRESS IN THE MODERN OFFICE

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An Occasional Paper

CHANGE AND STRESS IN THE MODERN OFFICE

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Professional, Industrial and Commercial Updating

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Dear Sir/Madam,

CHANGE AND STRESS IN THE MODERN OFFICE

Attached is a report by Sue Cox of the Centre for Extension Studies, Loughborough University of Technology. Commissioned by the FEU as a PICKUP project, the author explores - via the literature, a survey, interviews and discussion - the nature of the changes that are taking place in the 'modern office'.

By definition, therefore, Sue Cox pays particular attention to the impact of information technology on those who work in offices. Following an analysis of the changing office environment, the report attempts to identify the training needs that follow from such a changing environment, and sets up models to deliver appropriate training.

The author is specifically concerned to appraise the extent to which stress is a major factor in the types of change investigated: '... the particular focus of this report is towards stress management training as a specialist subject'. The evidence she gathers and the models adopted provide some indication that stress could be a more significant feature of business and office courses, and in section 4 she analyses some of the existing courses with this in mind. In this section she also suggests the framework of a modular training programme related to the management of stress in the modern office.

This report should be regarded as a curriculum resource for designers of PICKUP courses, and others who wish to provide more training in this area. The FE examining bodies may also wish to appraise their schemes in the light of this review. Not all readers will be convinced that stress and its management should be given such a central role in training for the modern office. However, most will probably accept the author's concluding remarks that a greater awareness of the contributory factors to stress is necessary; that training by the vendors of IT hardware and software may not be sufficient in this respect; and that coping with change deserves a place in any training programme.

Yours faithfully,

Jack Mansell

JACK MANSELL
Chief Officer

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The views expressed in this report are the author's, and do not necessarily reflect those of the FEU, CES or any other body.

INTRODUCTION

1. While there is currently much discussion of the rapid technological changes which are occurring at work, it is clear that there are considerable differences both in the nature and extent of such changes between organisations and in the rapidity of their introduction. The rate of automation is often much slower than is popularly thought (International Labour Office (ILO), 1984).

2. More new technology is being introduced into the office environment than into manufacturing (ILO, 1984). This is partly because the cost of the change is relatively smaller, and partly because office systems more easily lend themselves to automation. However, despite this, the stage of development of Information Technology (IT) in the average office is far behind the state of the art systems familiar to those in IT research and development.

3. Current employment trends, in relation to working hours, are towards early retirement and a shorter working week. Predictions for the 1990s are that white-collar workers will work 36 hours a week or less. At the same time, a recent survey of 200 European chief executives has highlighted the importance of white-collar productivity for many European organisations (Forman, 1984).

4. Many of the chief executives in that survey held the following beliefs:

- that white-collar productivity is at least as important as blue-collar productivity;

- that improving white-collar productivity will make a major difference to the competitive success of European companies in the future;

- that there is a lack of confidence in the current strategies for improving white-collar productivity;

- that European management is orientated towards traditional methods of improving productivity.

They also forecasted a drop in the number of white-collar workers as administrative tasks become more automated.

5. Clearly the adoption of IT in the office environment may be contributing to the increase in white-collar productivity. However, much depends on the way these systems are introduced, and the stress that may arise. Both anecdotal and research evidence suggest that workers are very apprehensive about the impact of IT in the office, and often realistically so. It is clear, however, that training solutions may be available for many of the problems faced by office workers in coping with the introduction of IT. Much is known about the management of stress and of technological change. What is now required is a preliminary training needs analysis in relation to work in the modern office.

Overview

6. This report summarises the findings of a study on stress management training in the modern office. It identifies the training needs arising from the modernisation of the office environment and the consequent stress experienced by staff, reflecting both the experience of change and the demands of the new IT environment. Although the training needs analysis is broadly concerned with the knowledge and skills required for effective performance in the modern office, the particular focus of this report is towards stress management training. Recommendations for further development work, to design the necessary training activities and learning materials, are included in the final section.

Structure of the Report

7. The body of the report is divided into four sections, with four appendices :

- The changing office environment
- Training needs
- Stress
- Existing courses and future developments

- Appendices.
  In order to simplify the text, the references, relevant data and questionnaires are included as appendices.

Sources of information

8. The data discussed in this report were obtained from several different sources :

- the available literature;
- information collected by the author through interviews with selected employers;
- questionnaires distributed through the Institute of Qualified Private Secretaries to their members in the Midlands area;
- a meeting held with the East Midlands Branch of the Institute of Administrative Management to discuss occupational stress. The experiences and problems of this sector were recorded.

Contact and collaboration with practitioners and researchers added to both the substance and the information base for this project. The author would like to thank the Human Sciences and Advanced Technology (HUSAT) Research Centre, Loughborough University; Stress Research, University of Nottingham; Work Research Unit, Department of Employment; WATCH Database, University of Surrey; The Office Technology Unit, The Polytechnic of the South Bank.

1. THE CHANGING OFFICE ENVIRONMENT

9. The term 'office' is currently used in several different ways: it may, for example, denote a physical work environment, but, on the other hand, it may describe a function within a larger organisation. Both of these uses share an implication of information handling or processing activities, and an involvement in systems of communication. 'Offices', however, do not function as isolated units, they are dependent on continual contact with other parts and functions of the organisation in order to maintain the necessary and efficient exchange of information.

The traditional office

10. Traditionally, office activities have been labour intensive, largely encompassed by administrative, accounting, clerical and secretarial jobs. These jobs were supported by relatively simple equipment, such as accounting machines, typewriters, filing cabinets, telephones and calculators. Typewriters and telephone communication systems remained essentially unchanged from their introduction in the late 1870s until the 1950s. The advent of the electric typewriter, which replaced mechanical power with an electric motor, did little more than speed up the typing process. Control of the machine remained in the hands of the secretary. The situation is now rapidly changing with the introduction of new computer-based IT into the workplace (Forester, 1980; Stewart 1985).

The modern office and IT

11. Major changes in the nature of today's office are occurring as a result of microprocessor-based technology, and such technology is becoming more powerful, smaller and cheaper to install. Many developments have depended on the combination of computing and telecommunications, now known as Information Technology (IT). This is being used to acquire, process, transmit and present information in all its forms - audio, visual, text and graphics. There is now an emphasis on the integration of IT with other office equipment. The most favoured approach is to consider

the components of such an integrated system in terms of the following applications (Henriques and Hoskins, 1984) :

- word management: creating and editing documents of all kinds;
- electronic mail systems: accessing information, memos, messages;
- electronic filing: storing and retrieving information;
- micrographics: storing information in greatly reduced space for easy retrieval;
- teleconferencing; person to person communication of information both orally and visually;
- accounting; spreadsheets, forecasts and cost analyses;
- project planning and management.

The best office system of the future, it is suggested, will be an integrated system developed stage by stage, highly flexible, and offering much freedom of choice, mobility and expansion (Thompson, 1985).

The traditional office vs the modern office

12. It is important to remember that, although the technology may have changed, the traditional office and the automated office of the 1980s still appear to share the same basic functions: both are concerned with the input, processing and output of information. However, much of the control of these functions has shifted from the office worker to the computer and offices have become capital, as opposed to labour, intensive. This has affected office workers in one of three different ways :

- their jobs have been lost, or
- their jobs have been deskilled, or
- they have had to retrain.

Introducing IT

13. To date, office automation has been a piecemeal process for many organisations, based on trial and error. Fairly typically this has involved an electronic or video typewriter for the director's secretary, a couple of word processors for the typing pool and personal computers for one or two managers. The interviews carried out as part of the present study suggest that the use of telecommunications systems has lagged behind progress in word and data processing. Often automation has been seen as the solution to a messy office system. However, experience shows that automating a mess only produces an automated mess. Insufficient effort has been expended on identifying needs and planning adequate systems to meet real requirements.

APEX study

14. A large survey on the introduction of IT in the office has been carried out by APEX (the Association of Professional, Executive, Clerical and Computer Staff). This usefully illustrates the extent of automation in office environments in the manufacturing sector. The Union surveyed a sample of 25,000 of its members in the Midlands area (its national membership is 110,000). Replies were received from more than 50% of those approached (APEX, 1984).

15. In summary the results of this survey were :

(i) Spread of industries

By far the largest number of companies came from the engineering industry (60%). This reflects the high concentration of engineering companies within the Midlands area. Other industries included in the survey were brick manufacturers, toy manufacturers, clothing manufacturers, food processing, bakeries, printing and publishing, together with some nationalised industries such as electricity and coal.

(ii) Number of employees

The total number of employees in the companies was some 77,000, of whom only 11,700 were APEX members. This reflects the large proportion of the employees in engineering manufacturing and associated industries who are members of the manual trade unions.

(iii) Types of equipment

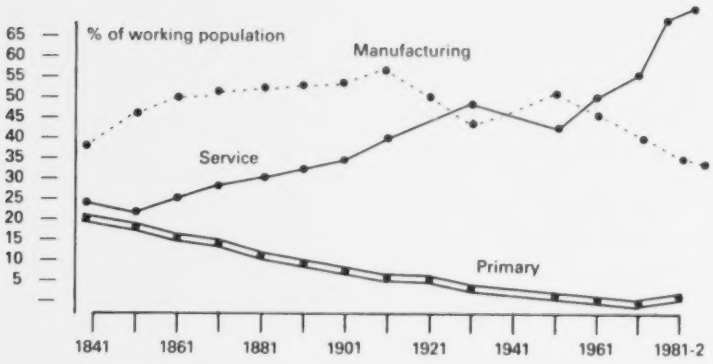
Only 8% of the companies had not introduced new office technology. 86% reported having visual display units (VDUs), although only 48% had word processors, and only 30% computerised telecommunications systems (telephone and telex systems). Despite the recession, investment in new technology appeared to be accelerating; the rationale is that companies need new technology to maintain their competitiveness. It is the view of APEX that an improvement in the profitability of United Kingdom companies will in turn lead to more investment in new technology.

16. The remainder of the APEX report concerned equipping the workforce to cope with these changes and to ensure a clear working role definition. Much anxiety was expressed about the effect of automation on job security, and it was postulated that new technology was now a key factor in unemployment.

The typical office worker

17. Despite the underlying pessimism expressed in the APEX report, it is important to stress that the survey dealt largely with the manufacturing industry. Current employment trends show a marked shift in employment from manufacturing to the service industries. Figure 1 (page 8) illustrates the employment patterns in the UK from 1841 to 1982. It shows the percentages of the population employed in primary, manufacturing and service industries. Since the 1960s, service industries have become the major employers (Department of Employment, 1979), and these cover a large proportion of office workers. Clearly it is difficult to describe a 'typical' office worker from the millions of people involved in such work.

Figure 1. Employment trends in Great Britain, 1841 to 1982



(Source: Manpower Implications of Microelectronic Technology, UK Department of Employment statistics, 1979, plus additional Department of Employment statistics).

Services employment, including office work

Manufacturing industry

Primary industries (mainly agricultural and mining)

Secretaries, typists and clerks

18. Much of the discussion about the modern office has focused on secretaries, typists and clerks. These staff are important but are only part of the picture, accounting for about 15% of all office costs (Peltu, 1984). Within this group there is a very wide range of skills reflecting different levels of job demand and responsibility, from the highly qualified personal secretaries to the unskilled clerical assistants.

19. 'Secretarial' work has become a key occupation for women :

- it has become a segregated 'ghetto' occupation (Hakim, 1978);
- in the region of 40% of all female school-leavers go into office work of some kind (Sharpe, 1976);
- the supportive nature of the secretarial role makes it a stereotypical female occupation (Silverstone, 1974).

Reflecting this, the Equal Opportunities Commission funded a major research report on the effect of IT on women's jobs (Bird, 1980).

20. It is a common observation that the adoption of IT requires this 'user' group to acquire new skills. This is often cited as a positive feature of office automation. However, it is obvious from the available evidence that, compared with the traditional range of office skills, the new skills tend to be fewer in number, less diverse and often less complex.

21. In addition to job-related problems such as these, many working women have to face the pressures associated with their dual role (SPRU, 1982). These pressures may affect not only performance at work but also the motivation and opportunity to retrain when required.

Managers, administrators and professionals

22. The largest group of office workers are managers, administrators and professionals (including architects, solicitors, estate agents, accountants, etc.). In comparison with the previous groups they generally account for about 60% of all office costs (Stewart, 1979). These groups of workers are predominantly male and are more highly paid. In terms of cost-effectiveness to the organisation, improved efficiency in the managerial sector is a prime consideration (see Introduction).

23. Whereas the first wave of new technology was aimed at developing typing activities and improving word processing, recent changes, improved communications and data analysis are more relevant to this group. It is particularly pertinent to note that

it is they who are usually involved in implementing the changes considered above.

Summary

24. i) The modern office is undergoing a process of change centred on the introduction of IT. Despite this, the basic function of the office remains unchanged.

ii) The introduction of IT into offices is not as well planned or managed as it should be. Employees are apprehensive about its impact.

iii) Two groups of employees are affected: secretaries and clerical workers who are predominantly women, and managers and administrators who are largely men. The working women may have the additional pressures of their dual role to cope with.

iv) Improved efficiency in the secretarial and clerical sector has a smaller impact on an organisation's costs than applying technology to aid managers and administrators.

2. TRAINING NEEDS

25. This section is concerned with the general training needs associated with work in the modern office identified by the author through her research, or highlighted in the available literature.

Methodology

26. Information was obtained from various groups using several different but complementary methods. It was thought that this strategy would highlight common needs.

Face to face interviews were conducted with the relevant training personnel from a number of local and national organisations. The interviews were semi-structured, each 'contact' being asked the same set of questions. The time of the interviews varied from 30 minutes to 2 hours: the extra content of the interviews also varied. (See Appendix III.)

Telephone interviews were conducted with local organisations. The interviews were arranged by letter and through the FEU Project Information Bulletin. The organisations approached are listed in Appendix III.

Questionnaires were distributed to all members of the Midlands branch of the Institute of Qualified Private Secretaries (IQPS) with their March journal. (At the time of preparing this report, 20% of the Midlands members had returned their questionnaires. A sample of raw data is included in Appendix IV).

Meetings were arranged with the East Midlands branches of the IQPS and the Institute of Administrative Management (IAM) to discuss the problems of managing change and much of the discussion focused on the particular problems of IT in the office environment.

A course on 'Women's Work: Women's Health' was organised as part of the CES programme, and articles advertising the aspects of the course directly concerned with IT were placed in 'office' magazines.

In the course of CES's training programmes for senior managers, the author was able to interview an additional group with the statutory duty under the Health and Safety at Work Act 1974 for health and safety training for office personnel, and a group of senior managers with administrative duties.

Results

27. The results are summarised in a series of short annotated sections. The early sections relate to an organisational perspective, while the later sections deal with the individual.

The organisational perspective

28. Many organisations were very co-operative. For others, however, the whole area of IT was perceived as a sensitive issue.

29. For many of the companies contacted, the focus of training with respect to IT was procedural and concentrated on the acquisition of machine skills. For most companies, a major problem in relation to procedural training was the structure and format of the machine manuals. It was generally felt that the acquisition of skills would be more efficient with more 'user friendly' manuals.

30. In medium to large size companies, training was usually provided in-house, but not always by, or in consultation with, qualified or experienced training personnel. In-house training by company personnel was most often given by management or computer services staff. Implicit in this observation is the age old paradox that often those with the greatest knowledge lack the skills required to convey it to others.

31. When training was provided from outside the company, the trainers tended to belong to the organisations supplying the equipment, e.g. IBM and WANG. Such training was in line with machine demonstrations and usually concentrated on the 'creation'

of a local expert. This training was often brief and relied heavily on the identification of an individual with good initial skills.

32. Several companies sent their senior secretarial staff or their most 'able' staff to IBM or equivalent suppliers for intensive (one week) training courses. In many cases, this training concentrated on a limited number of word processing skills, leaving some untouched and in reserve for later training. The cost of this method of training limits its applicability and availability.

33. Much of the training to date appeared to have concentrated on the secretarial and clerical levels and in many organisations there was a definite need to involve the professional and managerial staff. In some companies programmes were being instigated to encourage secretaries to bring their managers along to informal training sessions, especially with respect to electronic filing and improved communication systems.

34. Several companies reported 'problems' with certain individuals within their organisation who were reluctant to acquire IT skills. Within this group there was reference to the 'older' worker who was reluctant to adapt to change. The training needs of this group were seen to be related to coping with change and with improving self-confidence.

35. Increasingly, companies are able to recruit office staff with IT skills. However, such recruitment occasionally created problems for established staff with fewer of the new skills.

36. Several companies were in the process of conducting internal surveys on the levels of stress associated with IT and expressed an interest in receiving future training material. Most existing training programmes did not include 'state of the art' resumes of health and safety information and many managers reported that they would especially appreciate more training material information on the reproductive health hazards for women working with VDUs. Anxiety over this issue was often cited as a cause of stress. Most organisations felt they would be more efficient in managing change if they had appropriate information and training.

Summary

37. Several different types of issue were highlighted in the data: difficulties with current training practices and resources in relation to new office technology, difficulties with existing staff, lack of knowledge of stress and health and safety related issues, and lack of management preparation (see Figure 2). Overall, the issue of new technology was a sensitive one for many organisations, and an obvious source of stress in itself. Good reviews of the organisational impact of office systems may be found in Otway and Peltu (1984) and Birchall and Hammond (1981).

38. The problems identified at the organisational level could be approached in two ways: first, by improving existing training methods and practice, and second, by looking at the development of particular management skills in relation to the adoption of IT.

39. Existing training needs to be more exhaustive, dealing with the principles behind the use of IT in the office as well as with the procedures. It needs to involve management as well as those they manage. Ideally, it should deal at some time with mixed groups. The methods used and the support materials should be better developed and more user friendly. Finally, some attention should be given to the problem of who provides the training. Two issues need addressing. First, how much reliance is to be placed on the manufacturers and retailers of the hardware and software? Second, how can expertise in IT be effectively combined with a good professional knowledge of training matters and good training skills?

40. Improved management training should be linked to a monitor of stress levels within the organisation and an evaluation of current management practices in relation to IT. Managers appear to require more information on the management of change, stress at work, and health and safety in relation to IT.

Figure 2: Training Issues

Organisation:	Whole issue stressful at organisational level. Changes in culture. Changes in organisational structure and communication patterns.
Training:	Combining expertise in IT with training skills. Using unfriendly IT manuals. Emphasis on procedural training. Emphasis on secretarial/clerical training. Staff resistance to training.
Management of Existing Staff:	Resistance to change and training by vulnerable (older) workers. Introduction of new competent (younger) staff - challenge to existing staff.
Management Preparation:	Lack of management preparation. Lack of information on managing change. Lack of information of level of stress in organisation. Lack of knowledge on current health and safety issues.

The Individual perspective

41. Data on the indvidual perspective were collected from a questionnaire survey of IQPS members, and from discussions with members of the IAM. These are discussed below.

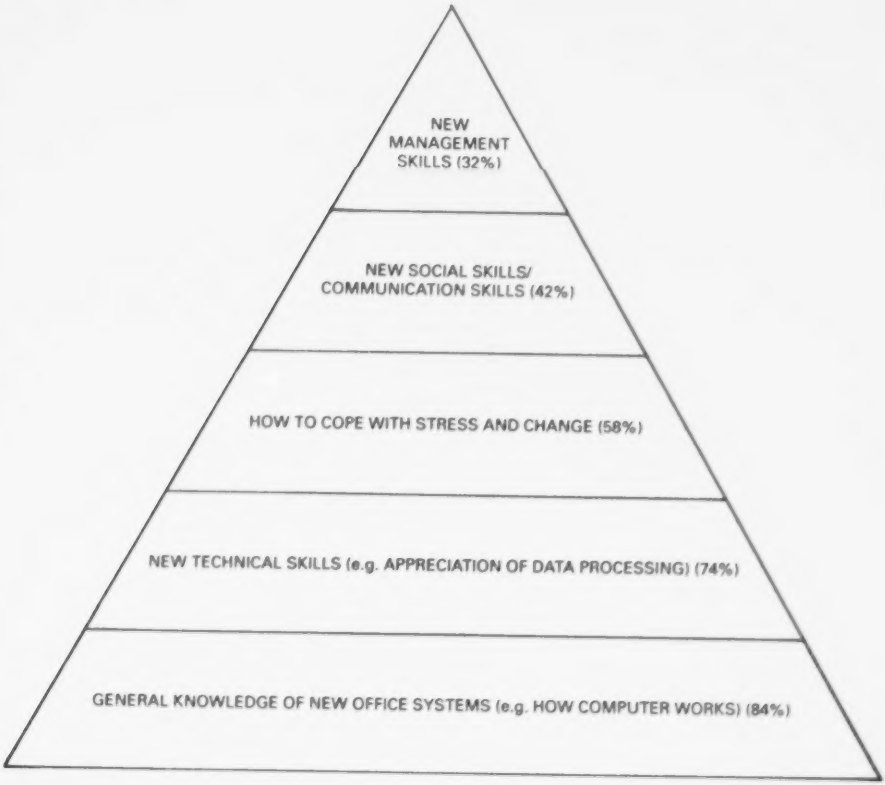
IQPS questionnaire

42. This group of office workers were representative of supervisory and lower/middle management. Their responses to the questionnaire highlighted several different needs :

- Fewer than half the respondents considered that their training in relation to IT was adequate.
- The majority of respondents required more general knowledge of new office systems (e.g. how computers work: principles).
- Half of the respondents wanted to know how to cope with change and stress (management of change: stress management (coping)).
- More than half of the sample required training in new technical skills (e.g. appreciation of data processing: procedures).
- About a third of the respondents also required training in new social skills (e.g. improved communication skills).
- A small proportion of repondents needed management skills training.

These data are represented schematically in Figure 3.

Figure 2. Training Pyramid derived from IQPS Data


NEW MANAGEMENT SKILLS (32%)
NEW SOCIAL SKILLS/ COMMUNICATION SKILLS (42%)
HOW TO COPE WITH STRESS AND CHANGE (58%)
NEW TECHNICAL SKILLS (e.g. APPRECIATION OF DATA PROCESSING) (74%)
GENERAL KNOWLEDGE OF NEW OFFICE SYSTEMS (e.g. HOW COMPUTER WORKS) (84%)

43. A recent ILO survey on the impact of microelectronics on this group of office workers concurred with these findings. It highlighted the fact that, whereas employers recognised the need for staff to receive basic training on the new equipment, they did not recognise the need for broader-based training to enable women to gain access to a wider variety of jobs. It stressed the importance of good management and communication skills (Werneke, 1983).

The Institute of Administrative Management (IAM) seminars

44. The seminars organised by the author for the IAM also highlighted problem areas and training needs. This group of office workers was representative of middle management. They were committed to the understanding of social factors in relation to IT. Further sessions have been arranged and contact with individuals in developing training material has been established.

45. Members of the IAM asked for training relating to the management of stress, including coping with change. They would also welcome more detailed information on the effect of communication systems on organisational effectiveness. In relation to management skills, the need for training in motivational techniques and decision making was indicated.

46. Many of the members of this group had experience of installing new information systems. They reported being constantly under pressure, ironing out initial 'bugs' in the system and coping with machine failures. Individual stress management was therefore high on their list of training requirements.

47. Several members of this group and their colleagues responsible for office safety expressed concern at discrepancies in the information relating to the health hazards of VDUs. Confusion in this area has led to VDU safety being at the centre of industrial relations disputes and bargaining positions. Managers need more precise information and training material in this area.

Summary of problem areas and training needs

48. The training needs identified through the survey and discussion groups overlapped with those described in the previous section. Individual workers (up to middle management grade) felt that they lacked adequate preparation and training for the new office technology. Five areas were highlighted: lack of general information on the principles of IT and of communication systems; lack of training in new skills (social and technical); lack of understanding of change and how to manage it and motivate others; lack of information on health and safety issues in relation to IT; lack of understanding of stress and stress management.

49. In talking to individuals, it was obvious that their training needs were related to their position in the organisational hierarchy. Figure 4 (page 20) schematically illustrates this point. At all levels there is a need for instruction in both the principles and the procedures relating to IT, but the balance depends on the level in the organisation. 'Top' personnel obviously require an emphasis on principles, while those 'at the coal-face' require more instruction in procedures. This is a traditional view, but there is a need for both groups to receive more and better instruction in the other aspects of IT skills acquisition.

Figure 4: Organisational Hierarchy and Individual Training Needs

ORGANISATIONAL HIERARCHY	TRAINING NEEDS
Senior Management	1. Job and organisational design 2. Management of change 3. Operating principles (and procedures) 4. Stress awareness
Middle Management	1. Management of change 2. Operating principles (and procedures) 3. Stress awareness and stress management (coping)
Supervisors	1. Supervisors as managers 2. Operating principles (and procedures) 3. Stress management (coping)
Operators	1. Operating procedures (and principles) 2. Stress management (coping)

Overall summary

50. The present data suggest that the training needs of the modern office relate to five areas:

- lack of adequate training in the new technical and social skills required by new technology;

- a lack of understanding of the principles involved in new integrated office systems: too much emphasis is being placed on operating procedures in current training;

- lack of understanding of what is involved in managing technological change at work, and lack of requisite skills;

- lack of understanding of stress and of different stress management strategies, including knowledge of job design and coping with change;

- lack of up-to-date information on health and safety issues in relation to IT, for example, reproductive health hazards for women working with VDUs, and repetition strain injury.

51. These training needs reflect the results of the survey, discussion groups and interviews, which together dealt with the issue of IT and the modern office from both the organisational and individual perspectives.

52. While several of these needs relate to technical understanding and skills, there was an expressed need for improved social skills and health and safety training. Beyond this, however, there was an obvious requirement for training in relation to stress awareness and management, particularly in relation to coping with change. This is explored in detail in the next section.

3. STRESS

53. The training analysis suggested that both office managers and their staff felt a need to understand better the nature of stress at work, and how they might manage stressful situations. Particular attention was drawn to the problem of managing and coping with change, and anxiety was expressed over a lack of up-to-date knowledge of health and safety issues. This section discusses the nature of stress at work and proposes a model of stress in the modern office. It then explores the possible design of appropriate stress management programmes.

Nature and effects of stress at work

54. The author's preferred definition of stress is based on the transactional approach (Cox and Mackay, 1981 and Cox, 1978, 1985).

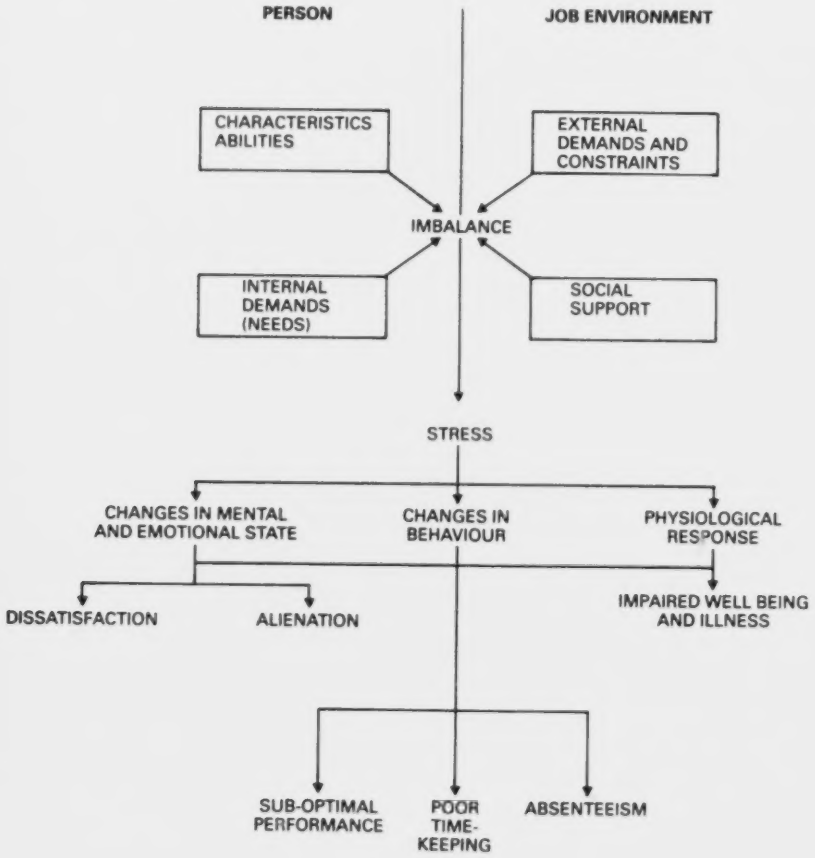
> Stress is a complex psychological state accompanied by unpleasant emotional feelings. It is experienced at work when the person's individual characteristics and ability to cope are not well matched to the demands of the job. Often the job's demands are too much or too difficult, but stress can also arise when jobs are not sufficiently challenging. The experience of stress and the problem of coping are made worse if the person has little freedom or control over their activities, or has little support from colleagues or supervisors. The analysis of stressful situations can be based on these factors, but needs also to identify the common sources of stress (Cox, 1983).

Since stress by its very nature is an individual phenomenon, the anxieties felt by office workers will inevitably vary from individual to individual. However, this does not preclude consensus between individuals.

55. The effects of stress manifest themselves in changes in the way the person views the world, behaves in it and responds to it physiologically. Some of these changes can involve loss of job satisfaction and feelings of alienation, and sub-optimal work performance. These individual effects may be reflected at an

organisational level in poor timekeeping, low productivity, absenteeism, poor morale and combative industrial relations (Marshall and Cooper, 1981). The prolonged experience of stress has been shown to precipitate or accelerate serious illnesses, and, less dramatically but as significantly, contribute to sub-optimal health, and an impaired quality of working life. This is represented schematically in Figure 5.

Figure 5. The Transactional Model of Stress (Cox and Mackay, 1981)



56. The study of stress at work seeks to describe the factors influencing the frequency, spread and effects of occupational stress and to develop strategies for managing adverse outcomes. There has been much research in the last 60 years, and a larger number of factors have been considered as potential sources of stress at work. Some of these are set out in Figure 6. Whether or not any of these contribute to the experience of stress in any particular workplace depends on the interaction of a number of individual, organisational, social and technological factors.

Figure 6: Potential Sources of Stress at Work

A Physical Properties of the Working Environment

Noise
Extremes of heat, cold, humidity, pressure etc.
Level of ionising and non-ionising radiation
Lighting
Bad man-machine design/interface

B Time Variables

Length of working day
Irregular hours and shift work
Deadlines
Time pressures

C Social and Organisational Context of Work

Organisational climate and culture
Social environment
Administrative framework
Machine pacing/Monotony
Workload, overload or underload
Responsibility
Participation
Extrinsic and Intrinsic Rewards/Piece-work v Hourly Paid
Industrial relations

Relationships with superiors, peers and subordinates (including conflict)
Abilities/Training
Opportunities for promotion
Participation

D Role Related

Role ambiguity v clarity
Role conflict
Degree of control over work process
Responsiblity for people
Responsibility for things
Participation
Communication and feedback
Individual abilities

E Job Design

Machine pacing/Monotony
Workload, overload or underload
Responsibility
Extrinsic and Intrinsic Rewards/Piece-work v Hourly Paid
Job complexity - quantitive load
Quantitive overload or underload
Boredom/Monotony of job
Payment
Degree of control over work processes

F Changes in Job

Loss of job - unemployment
Introduction of new work practices/automation
Quantitive changes in job
Promotion/Overpromotion
Transfer of job location
Change in shift pattern
Null changes

G Legislation

Employment Protection Act
Health and Safety at Work Act
Equal Opportunities Legislation

H Home/Leisure Related

Stressful life events, e.g. marriage/divorce
Death of a spouse
Demands of family particularly for working women

Stress and the modern office

57. There is a developing literature on the sources of stress associated with the office environment, and with managerial, secretarial and clerical work (see example, Marshall and Cooper, 1981; Grandjean 1984). Eight or possibly nine sources of stress have been identified in relation to the office environment. The main problems referred to in the published literature are summarised below.

(i) The physical work environment: for example, lighting and heating, humidity, ionic balance in atmosphere, noise levels, and chemical and biological hazards.

(ii) The introduction of IT and the experience of change.

(iii) The design of the work station, particularly in relation to postural and visual problems and those otherwise associated with the use of VDUs.

(iv) The nature of the man-machine interface and the design of computer-based tasks; issues of user acceptability and equipment reliability (breakdowns).

(v) The organisation of work and the design of jobs; for example, issues related to work/rest schedules, repetition in work, deskilling, and number of people responsible to.

(vi) The style of office management: communication, leadership and motivation.

(vii) Career problems and role definition.

(viii) Organisational problems: job security and pay.

(ix) Sex discrimination and feelings of inadequacy.

Other possible issues (and problem areas) are set out in Figure 6: these are derived from a current review of occupational stress research. Reference to more detailed accounts of the physical stressors is included in Appendix II together with recommended texts.

58. Recently, many of these issues have been dealt with in terms of health and safety issues (see paras. 63 to 68). In addition to these problems, there are issues related to the selection and training of personnel, and the degree to which they have the personal resources and skills to cope with work in the new office environment. Two issues are discussed in more detail below as they were identified as areas in which office managers and their staff lacked information.

Introduction of IT and the experience of change

59. Four interrelated problems are often cited in discussions on the introduction of IT into the office :

(i) the process of change itself and the way in which IT is introduced (Department of Employment, 1982);

(ii) the design of the jobs and of the work stations created in the new office (Cakir, Hart and Stewart, 1980; Stewart, 1985; Mumford, 1979, 1983);

(iii) the social and organisation changes which occur as a result of the introduction of IT (Cox, S., 1984);

(iv) the personal anxieties resulting from such change, e.g. current debate over the occupational health of women

operating VDUs and other office equipment, anxieties over job losses (e.g. Cox, S., 1985).

60. The experience and management of change were cited as suitable areas for further training. Why is change a potential source of stress? Change may be perceived positively as a challenge, or experienced as a threat and source of stress. There are several reasons why the changes implied by the introduction of IT might be experienced as stressful :

- Such changes may increase the person's uncertainty over their future. This may take different forms, from worries over job security to anxiety about the nature of a redefined job, from uncertainty over pay to concern for career prospects.

- Such uncertainty and anxiety is often related to a felt lack of control over the events surrounding and going to make up the changes which occur. There may be a feeling of helplessness, which can contribute to the development of apathy and, in the worst case, depression.

- As a result of the changes, the person may lose status, and their job may be deskilled. If this occurs there may be a marked loss of job satisfaction.

- If the changes require the person to learn new skills, this may represent an unwanted challenge, particularly to older workers. The difficulty of learning new skills and the fear of failure may combine to produce anxiety.

- The effort of adapting may be unwanted and induce both fatigue and resentment.

Change and the organisation

61. In the course of the author's studies on the management of stress and change, senior secretaries were asked to list two or three items which had caused them anxiety in relation to change at

work. Most of those taking part cited worries about organisational changes and the lack of role definition as a result of the introduction of new technology (Cox, S., 1984).

62. The introduction of new technology has typically resulted in a 'flatter' organisational pyramid with fewer levels of management. In the case of office technology, the number of supervisors is likely to diminish as more clerical workers and typists are able to check their own work. This can result in problems of role definition and the necessity for supervisors to adopt more supportive leadership roles rather than simply function as checkers and controllers.

Health and safety issues

63. The current publicity in connection with health and safety and VDUs has increased anxiety in many office workers, in particular in female workers (Pearce, 1984). Whilst there is nothing intrinsically harmful about VDUs the level of visual demand associated with such tasks and the necessity for adequate workstation design increases the importance of health and safety in the modern office environment (Mackay, 1980; Cox, S., 1985).

64. It has been shown that when work stations are badly designed, working with VDUs can result in discomfort and fatigue. This fatigue can arise from postural problems or from other factors, including the visual and cognitive demands of the task. These effects may be exaggerated by individual visual disabilities and high mental load. Fatigue may be experienced as various symptoms of discomfort, or strain in the eyes, neck, back and other parts of the body (repetition strain injury). However, eye strain is not necessarily an indication that the source of the problem is visual: the eyes may act as an 'early warning system' for the rest of the body. Physical manifestations of distress may, however, also reflect an individual's psychological state (Cakir et al, 1980).

65. Of particular concern to female VDU operators are issues relating to the possible radiation effect of the display unit on

pregnant women. An alleged higher than normal incidence of miscarriage and other abnormal pregnancy outcomes among operators had lead to requests from unions that pregnant women should have an automatic right to be transferred to other work if they wish. Few employers are prepared to accept such a proposal. However, because of the stress caused by raising this issue, some employers have accepted informal agreements on job transfer.

66. Considerable anecdotal evidence relating to the experience of very small groups in North America has been collected. However there have been no statistically reliable higher than normal incidences recorded, only what are referred to as expected 'unexpected' clusters (Cox, S., 1985).

67. The Council of Civil Service Unions (CCSU) has attempted to get an agreement at a national level for a blanket right for pregnant VDU operators in the Civil Service to be transferred on demand. It has cited in support of its argument a study in the Department of Employment data processing centre in Runcorn, Cheshire. However, this study has been shown to be inadequate in establishing an association between VDU work and abnormal pregnancy. The current Civil Service guidelines on the use of new technology state that 'it is still the case that no link between VDU usage and increased risk of miscarriage has been established in any study anywhere and Medical Advisory Service advice will continue to be that removing a woman from VDU usage simply on account of pregnancy is not necessary'.

68. A press release from HM Treasury also adopted this viewpoint, but underlined the importance of treating staff sympathetically and of accepting that the transfer of a pregnant operator who is worried or concerned about the work on VDUs may be necessary (HM Treasury, 1985).

Model of stress in the modern office

69. A model of stress in the modern office can now be described. It is a development of the transactional model of occupational stress (Cox, 1978; Cox and Mackay, 1981 - see Figure 5 page 23).

Demands and constraints

70. Central roles are assigned to the requirements and demands of IT, and those related to a continual process of change. It is assumed that office environments are going to be subject to change for a long time to come. This will take the form of 'critical periods of major upheaval' interspersed with a steady evolution of new forms of work and working. Change can bring with it several different types of anxiety; these have been described earlier.

71. These sources of demand are set in the context of the normal array of pressures and demands experienced by those who work. These reflect the person's task and equipment, their workplace, the organisational and social aspects of their work, their roles and non-work commitments. The degree of exposure to IT and to the associated process of change is one factor that marks the office environment as different from other workplaces in respect to occupational stress.

Individual resources

72. The model based on the present data assumes that generally office managers and their staff are deficient in the knowledge and skills required to cope with the job demands that they face. This deficiency relates not only to technical understanding and skill, but also to social skills, health and safety, and coping with change and other sources of stress. The degree to which office staff are deficient in the necessary personal resources to cope with their changing work is another factor and marks the office as different from other workplaces.

Social support

73. There is some evidence in the present data to suggest that social interaction and support in office environments is more restricted than in other workplaces. This is partly due to constraints imposed on movement by continual working on a VDU in one work station.

Possible outcomes

74. The literature suggests that office staff are apprehensive and anxious about the changes associated with the introduction of IT. The present data suggest that this may be expressed in terms of resistance to retraining and a lack of general co-operation with management. The wider literature on stress at work suggests a number of other outcomes: sub-maximal performace, poor job satisfaction, absenteeism, poor timekeeping, and negative attitudes to work. The person's general and social well-being may also suffer. It was beyond the scope of this project to examine these outcomes in any detail. Suffice it to point out that, should any of these outcomes occur, then any anticipated gains in productivity through introducing IT may be lost.

Stress management

75. An early outline of stress management strategies was presented by Cox in 1978 based on the transactional approach to occupational stress. More recently, he has argued (Cox, 1985) that such strategies can be usefully described in terms of three groups :

- stress prevention programmes
- training in coping skills
- stress reduction techniques.

Stress prevention programmes and training in coping skills are self-explanatory. Stress reduction involves reducing the harmful or at least unpleasant effects of the experience of stress. None of the solutions offered is magical or mystical, nor are the strategies used particularly new in conception.

76. Stress prevention programmes rely heavily on the integration of existing skills and practices in relation to selection and training in the workplace and job design, organisational development and the management of others.

77. Training in coping skills involves either improving the general skills required for everyday life at work which may be

deficient in some way or identifying and developing new skills specifically for managing stressful situations.

78. Stress reduction techniques depend on a thorough knowledge of the behavioural and physiological effects of stress and of how to educate and train people in healthy living and effective but harmless palliative methods.

79. In training managers and their staff in stress management, three objectives need to be met :

- developing an awareness and understanding of the nature and effects of stress at work;

- developing an ability to identify and analyse stressful situations at work;

- developing an ability to evaluate and integrate the full range of possible solutions to such stressful problems.

These objectives are set within a problem-solving approach to stress management. The effectivensss of such training, and any subsequent action, is dependent on a sufficiently detailed analysis of the problem and competence in the application of the solution(s) chosen. A good working knowledge is needed of the occupational and organisational context in which such training is required. Thus the analysis of the sources of stress associated with the modern office is a prerequisite of stress management training in that area.

80. An outline of the analysis of stressful situations has been presented (Cox, 1985), again developed from the transactional approach to occupational stress. The obvious value of following such an approach throughout is that it provides a coherent and integrated programme sensibly underpinned by theory.

4. EXISTING COURSES AND FUTURE DEVELOPMENTS

Overview

81. As a result of this study, it seems clear that, in order to maximise the efficient use of IT in the office environment, more attention should be paid to the human resource. This is also the conclusion reached by Thompson (1985), Stewart (1985) and by Waring (1985) in relation to curriculum development of relevant training courses. Furthermore, many managers and office workers interviewed in the survey strongly agreed with this point of view.

82. The main problems identified in the study were related to a lack of preparation of managers and their staff for the introduction of IT. Existing training provision was shown to be inadequate and knowledge and skills were lacking in five key areas. These related to :

- the principles involved in IT;
- the social and technical skills required to use IT;
- the knowledge and skills required to manage change;
- an understanding of stress at work and stress management;
- an up-to-date knowledge of health and safety in relation to IT.

Furture training developments should focus on these areas. Stress management training should encompass the last three.

Existing training provision

83. In the context of the recommendations of the project, the author reviewed the existing training provision and made contact with other training bodies working in the area of IT. Particular reference was made in any discussions to curricular developments in social factors in relation to IT. Details of some of these courses are given below.

Office Technology Unit (OTU), Polytechnic of the South Bank (Director: Lyn Antill)

84. The OTU is preparing a distance learning course 'The Introduction of Office Technology' under the sponsorship of the Open Tech Unit of the Manpower Services Commission. This course aims to :

- increase awareness of the scope and limitations of new technology in the office;
- show students how office work is changing;
- help them to utilise information sources fully;
- train them in new practical skills and techniques.

It consists of six modules :

1. Introduction to Microcomputers
2. Introduction to Word Processing
3. Introduction to Information Systems
4. Introduction to Telecommunications
5. Introduction to Office Environment
6. Introduction to Social Factors of Information Systems

It is particularly interesting to see that this course includes a module on social factors as an integral part of the course. This module is still at the development stage and will include 'stress' and 'managing change'. This package is intended for basic clerical grades of office workers or for those students seeking an introduction to IT.

WATCH Database

85. The University of Sussex has set up a bibliographic database containing references to recent and current research in the area of technical change and women's employment (SPRU, 1982). It includes reference to current training initiatives in this area. The focus of much of this work relates to the lack of training opportunities for many women employed in offices using IT.

The Business and Technician Education Council (BTEC)

86. The prospectuses and available literature on several relevant BTEC Post Experience courses were studied. It was evident that material on stress management could readily be incorporated into the curricula of several of the courses.

'Managing the Office'

87. This unit is designed for those concerned with administering the office function of an organisation and as such is intended for those in managerial posts. It aims to develop specific practical skills in office management and administration and to promote an understanding of the overall role of 'the office' in an organisation. It contains a section on the supervision of staff in order to ensure maximum efficiency and profitability. It aims to provide participants with the requisite knowledge to appreciate the job satisfaction and social needs of employees.

'The Management of Computer-Based Technological Change'

88. This unit is designed to assist managers and trade unionists to understand the problems relating to the introduction of new technology. One of the modules is concerned with assessing the social and organisational impact of new systems and refers to the psychological impact of change on people at all levels in the organisation.

89. Both these BTEC courses could be further developed to include sections on the management of stress.

'Supervising Word Processors'

90. This course is intended for those people who are, or are likely to be, in a supervising capacity over the word processing function of an organisation. It links with other post experience units in the areas of computing and supervisory skills and includes both managerial and technical skills in the curriculum.

91. However, although it includes the following supervisory skills and knowledge, it does not contain any training on stress

management. Such material could be easily integrated into the curriculum and would enhance the supervisory ability of the 'trainee'.

SKILLS	KNOWLEDGE
identify the impact of word processing on the office organisisation and effect on job responsibilities	factors affecting job satisfaction in the office
identify the changes involved when word processing methods are introduced into offices and the ways of coping with these changes.	awareness of individual responses to change

Centre for Extension Studies, Loughborough University of Technology (Director: Mr Van Ments)

92. The author runs a programme of commercial stress management courses at Loughborough University. These courses cater for middle to senior managers from a variety of organisations and are over-subscribed. They are participative in nature and adopt a workshop design. The aims are :

- to explore the nature of stress and the characteristics of stressful situations at work;
- to identify and discuss the problems in the participants' organisations;
- to consider indivdual and organisational effects;
- to develop an understanding of the nature of intervention strategies.

The general nature of the material in the workshops could be modified to focus on the office environment.

93. The author also provides courses on 'Women's Work: Women's Health'. These cover some of the stress and health and safety information identified by the training needs analysis.

Stress Research Group, Department of Psychology, University of Nottingham (Director: Dr T Cox)

94. This group has recently reviewed the stress management courses offered by a sample of 50 UK industrial trainers and organisations. Their survey showed that :

- Most courses concentrate on stress reduction techniques and offer relatively general training, superficially appropriate to many different types of work. Few are tailored to the needs of particular groups.

- Many course tutors are neither qualified in a relevant profession, such as occupational psychology, ergonomics, health education or occupational medicine, nor have any proven track record in stress research.

- Much of what is on offer does not appear to have been systematically developed from either a sound knowledge of current research or an analysis of the job-related problems of the client group.

- The obvious lack of training needs analyses in this area is matched by a similar lack of evaluation studies.

These observations were presented in a paper at the Annual Institute of Personnel Management Conference (Cox, T., 1985 (a)).

95. The Stress Research Group is currently developing and evaluating different forms of stress management programmes. The application of this research, particularly in the areas of stress management training and health education in the work place, is provided for by Maxwell and Cox, who can also provide advice on job design and work organisation. Contact: Dr. T. Cox, 5 Hales Close, Cotgrave, Nottingham NG7 2RD.

Future development work

96. It is suggested that a modular training programme be developed, based on workshop techniques, to cover the needs of the modern office in relation to stress at work. Five modules are envisaged :

(1) An introduction to stress in the modern office.

(2) Change: its nature and management.

(3) Stress at work and its management.

(4) Health and safety and IT.

(5) Monitoring and evaluating stress management in the modern office.

Each module would be supported by a trainers' manual and suitable audio-visual materials. The package might be used by any particular organisation or work group, or parts of it might be selected (2 to 4) and used with the introductory and concluding modules (1 and 5). Guidelines on selecting the right package might be developed and made available to organisations and groups.

97. The presentation of recent training material is beginning to rely on new technology. In particular, the use of interactive video is gaining in popularity. For example, an interactive video on stress management is being developed by the BBC Open University production team sponsored by the MSC. To develop an interactive video disc especially for stress management in the modern office would be particularly expensive. However, if successful, it would be a worthwhile project and produce an excellent basis for distance learning.

98. As a cheaper alternative, a video tape could be produced to be used in conjunction with a tutored training manual (tutored video instruction). A particularly useful format is that adopted by the 'trigger' training films, which links a series of

vignettes with documented discussion notes. An early and general example of tutorial video instruction is provided by the Mental Health Film Council's 'Stress at Work'. Developed in the early 1980s by Tom Cox and Joseph Kearns, this film is now somewhat dated. In the area of stress management a tutored training session is preferable in view of the nature of the training material.

5. CONCLUSION: TRAINING NEEDS

99. The findings discussed here have implications for both office management and the individual office worker. Three main training issues require fuller attention.

- There is an obvious need for those who are responsible for the design and management of office jobs to be fully aware of the importance of ergonomic, psychological and health and safety factors. Most, however, do not fully understand the role of these factors or do not know how to take them into account. Thus further training is indicated in this area, possibly in the form of stress awareness and management training including job design seminars, courses in health and safety and standard management training.

- It is obvious that, in practice, insufficient preparation or training is given to individual workers in relation to the use of new office technology. There is a need to consider new social as well as technical skills. Further and more adequate technical training is indicated, and the whole rationale and structure behind this provision should be examined. It may not be sufficient to rely on brief sessions provided by hardware and software companies, and on often inadequate manuals.

- Much of what occurs is related to the fact of change in the office environment. Managers are not always aware of how to introduce and handle such change, and training could be given in this area. Furthermore, workers are rarely provided with any skills or information relevant to coping with change, and training might be given in this area.

100. In many of these areas, the training required is not new, either in content or method of presentation. However, the context of such material should be the office environment to ensure the most effective training outcome.

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Werneke, D., 1983, **'Microelectronics and Office Jobs'**, The Impact of the Chip on Women's Employment, International Labour Office, Geneva.

APPENDIX II : THE AVAILABLE LITERATURE AND RECOMMENDED TEXTS

A review of the literature was carried out using two different computer searches: the Californian based DIALOG system and the British 'HSELINE' database file. Both operate against specified key words. In addition, the Journal of Occupational Psychology, Behaviour and Information Technology (BIT) and Ergonomics were scanned.

There is a growing literature relevant to office automation and to the study of work in the office environment. This focuses on several different but interrelated issues: the introduction of new technology and the management of change, the design of jobs, equipment and work stations, organisational structures, occupational health of office workers and equal opportunity issues.

It draws on the expertise of many academic disciplines. The presentation and orientation of information reflects this diversity and documents studies carried out by, among others, computer scientists, engineers, systems analysts, ergonomists, psychologists and management specialists. Given the enormous quantity of published material, there is relatively little on the training needs of office workers in relation to the adoption of IT and the concomitant stresses of the office environment. Similarly there is surprisingly little case study documentation on how organisations fare in their attempts to harness the technology. This reflects the scarcity of controlled studies and evaluations in this area and the emphasis on office equipment rather than personnel. However, many of the authors make reference to occupational stress in their articles without coherent models and strategies for coping.

Much of the recent literature is referred to in the appropriate sections of the text. In addition, a selection of recommended texts is included in this appendix.

The changing office environment

(i) **'The Microelectronics Revolution'** edited by Tom Forester,1980
Basil Blackwell, Oxford.
ISBN 0 631 11651 6.

This book is concerned with the impact of new technology on society and has four excellent chapters on office technology:

J. Christopher Burns	- The automated office
EDP Analyser	- The experience of word processing
A.E. Cawkell	- Forces controlling the paperless revolution
Hazel Downing	- Word processors and the oppression of women.

(ii) **'The Electronic Office'**, Malcolm Peltu, 1984,
Ariel Books, British Broadcasting Corporation, London
ISBN 0 563 21056 7.

This book provides an excellent introduction to IT. It describes what new technology does, how it will be used in offices, its effects on organisations and jobs and how people can control its impact.
(Peltu has recently published a text on the management of information technology.)

(iii) Work Research Unit Publications, London

'Introducing New Technology into the Office', Richard Smith, 1981, WRU Occasional Paper.
'New Office Technology - People, Work Structure and the Process of Change', Linda Thompson, 1985, WRU Occasional Paper.

Both these publications trace the developments in office technology and their impact on information workers. The main concern of both these authors is the human resource.

These papers are available on request from Christine Goodair, WRU, Tothill Street, London SW1.

(iv) **'Visual Display Terminals'**, A. Cakir, D.J. Hart, and T.F.M. Steward, 1980, John Wiley and Sons, Chichester.
ISBN 0 471 27793 2.

This is a more detailed text which is concerned with work-place design, ergonomics, task organisation and health and safety of the office environment. It is particularly useful since it provides an introductory background to VDTs. This is necessary for an understanding of the man-machine interface.

(v) **'Women at Work'**, special edition of **Ergonomics**, Vol 27, (5), May 1984, edited by S. Cox, T. Cox, and G. Steventon.

This is a particularly useful publication since it highlights the current trends in female employment It contains papers relating to occupational stress and working women, occupational health and safety, and also considers secretarial work and the training needs of female managers.

(vi) A useful checklist on the design of new technology offices is **'The New Technology Office Checklist'** by O'Neill and Birnbam, Ergonomics Unit, London University.

(vii) **'Visual Display Units'**, Health and Safety Executive Publication, 1983. HMSO, London.
ISBN 0 11 88 3685 4

'Stress'

(i) **Stress**, Tom Cox, 1978, Macmillan, London.
ISBN 0 333 19403 9

This book provides an excellent introduction to the complex subject of stress. It examines the nature of stress and the wide range of effects it can have both at work and outside the working situation.

(ii) **'Microelectronics and the Quality of Working Life'**, R.G. Sell, Work Research Unit Occasional Paper No.17.

This paper considers the way work is organised in the IT office and focuses on the impact on the individual worker and the quality of working life.

(iii) **'Meeting the Challenge of Change - Case Studies'**, 1982, HMSO, London
(and **'Meeting the Challenge of Change - Guidelines'**, 1982, HMSO, London)

The first booklet contains a series of case studies, some of which are particularly relevant to the office environment (e.g. 'Lloyds Register of Shipping' by Terry Quinlan), where technological changes improved the quality of working life.

The case studies and the companion booklet, **'Meeting the Challenge of Change - Guidelines'**, draw out the common features of the case studies and provide guidance for the future.

(iv) **'Designing Secretaries'**, Enid Mumford, 1983, Manchester Business School, Manchester.

This book is a useful text in considering the management of change. It described a case in which secretaries participated in the successful redesign of their own jobs with the implementation of IT.

(v) **'Coping with Stress at Work'**, Judi Marshall and Cary Cooper, 1981, Gower Press, London.

Describes a series of case studies where stressful situations have been successfully managed.

(vi) **'Coping with Stress'**, Donald Meichenbaum, 1983, Century Publishing, New York.

This book provides an introduction to individual coping mechanisms.

Stress and the modern office

The stressors highlighted in the main body of the report are well documented in the literature. Some of the relevant information sources are listed below.

(i) The physical work environment

A great deal of research in this area has been carried out by Husat Research Centre, Loughborough University of Technology. Other research includes:

Anderson, D., 1980, **'VDUs Eyestrain or Eyewash?'**, Health and Safety at Work, August, 36-39.

Cakir, A., 1978, **'The incidence of eyestrain among VDU operators'**, Eyestrain and VDUs Conference, The Ergonomics Society, Loughborough.

Collins, B.L., 1976, **'Review of psychological reactions to windows'**, Lighting Research and Technology, 8, 80-88.

Dainoff, M. and Happ, A., 1981, **'Visual Fatigue and Occupational Stress in VDT operators'**, Human Factors, 23, 421-438.

Mackay, C., 1980, **'Human factors aspects of visual display unit operation operation'**, Health and Safety Executive Research Note 10, London.

Ridley, J., 1983, **Safety at Work'**, Butterworths, London.

Ridley's book is used as a recommended text on the Diploma of Occupational Health and Safety, Loughborough University of Technology. It contains several chapters which are relevant:

Radiation,	A.D. Wrixon
Noise and Vibration,	R.W. Smith
Lighting,	E.G. Hooper

(ii) The design of the work station

Grandjean, E., 1984, **'Ergonomics and Health in Modern Offices'**, Taylor and Francis, London.

This book is a comprehensive review of the hazards and effects of the changing requirements of modern offices.

Stammerjohn, L.W., Smith, M.J. and Cohen, B.G., 1981, Human Factors, 32, 401-412.

(iii) The nature of the man-machine interface.

Cohen, B.G.F., 1984, **'Human Aspects in Office Automation'** Elsevier, New York.

O'Neill, J., 1984, **'The Human Factor'** Technology Ireland, (December).

(iv) The organisation of work and the design of jobs.

Buchanan, D.A. and Boddy, D., 1982, **'Advanced Technology and the Quality of Working Life: the effects of work processing on video typists'**, Journal of Occupational Psychology, 55, 1011.

Smith, M., Cohen, B. and Stammerjohn, L., 1981, **'An Investigation of Health Complaints and Job Stress in Video Display Operators'**, Human Factors, 23, 387-400.

Articles relating to the management and organisational stressors can be found in most recent management texts. However the following texts provide an excellent overview of most of these areas of concern:

Adair, J., 1983, **'Effective Leadership'** Pan Business Management, London.

Rees, D.W., 1984, **'The Skills of Management'**, Croom Helm, London.

Warr, P.B., 1974, **'Psychology at Work'**,, Penguin Education, Harmondsworth, Middlesex.

'Managing the Introduction of New Technology', New Technology Research Group, University of Southampton, Omega, 1985, 13, (4).

APPENDIX III

Structure of Interview

Results

Selected Annotated Interviews from :

- Pharmaceutical Co. (a)
- Pharmaceutical Co. (b)
- Electrical Distributors
- Industrial Gas Manufacturing Co.

Telephone Interviews

Project Information Bulletin

Structure of Interview.

I am carrying out a project for PICKUP/FEU on the identification of training needs arising from the modernisation of the office environment. I am particularly interested in how the individual 'worker' coped with the changes and how the efficiency of the 'new' office matched up to expectations.

1. Has your organisation invested in IT in any of your offices?
2. What type of equipment have you installed?
3. How recent were these changes?
4. How many staff or sections did they involve?
5. What type of office staff were involved in the changes?
6. What type of training did they receive?
7. Was the training they received adequate?
8. How did you identify their training needs?
9. Did you involve the staff in the change and were they given any background knowledge?
10. Have you questioned individuals to find out if they felt their training was adequate?
11. Did you have any problems in introducing IT?
12. Did any staff express particular anxieties, about either the new office equipment or any organisational changes or job changes which occurred as a result of the introduction of IT?
13. Would you object if I interviewed any of your office personnel about their jobs?
14. Are there any changes necessary in your training programme?
15. Would you find training material relating to stress management of use to your organisation?

Selected Annotated Interviews

Organisation	Comments
1. Pharmaceutical Company (a)	1. Discussion focused on the modernisation of the Personnel Department Office with the implementation of I.B.M. word processors. 2. Training had been carried out 'in-house' using experts from the Management Services Dept. 3. The principle of lead operators was adopted. 4. Training was based on the acquisition of procedures. 5. An in-house survey found that many of the secretaries (N = 26) had some problems and difficulties with their training. 6. (i) Many secretaries had difficulties with the manual. (ii) They would have appreciated more training in the background (principles). (iii) They needed time away from their department to assimilate training. 7. 'Management' in this section had not received training in IT. 8. Collaboration on the use of any applicable stress management material was established.
2. Pharmaceutical Company (b)	1. The important factor in this interview was the problems encountered with the 'middle-aged' female clerical workers in adapting to IT. 2. Difficulties had also occurred as a result of problems of work-station design and user acceptability. 3. Training in word processing skills followed training manuals and relied on local experts.

Selected Annotated Interviews

Organisation	Comments
2. Pharmaceutical Company (b) cont'd	4. Training had involved the Occupational Health Unit in occupational health and safety.
3. Electrical Distributors	1. This office was located within the Head Office in Birmingham and was responsible for processing the orders nationally and providing a 'typing pool'. 2. It was interesting in that it contained a mixture of 'old' and 'new' technology. 3. In the implementation of word processing a separate section was created in the Department. 4. The whole office was involved in the installation and higher management collaborated with the office manager. 5. Training was carried out by the office manager initially and later by the section head. 6. Training included sessions on 'personal anxieties', in particular on health and safety, and reassurances on any job losses. (Help would have been appreciated with training materials.) 7. A new telex system had recently been installed without prior consultation with the office manager. This caused many problems and highlighted the necessity for total involvement of personnel in charge. 8. Several interviews were carried out with the staff in this department and this particular visit was extremely worthwhile and would make an excellent case sutdy. 9. One of the three office supervisors in the office had been under extreme stress during the introduction of the new technology.

Organisation	Comments
4. Industrial Gas Manufacturing Company	1. This office was highly automated using WANG office systems. (Highly capital intensive). 2. Training was necessary to make the best use of the equipment. 3. Work stations had been introduced in a phased manner rising from 16 work stations in 1980 to 31 work stations in 1984. 4. Training was carried out for the supervisory grades on the suppliers' premises and for lower grades by self paced cassettes. 5. Fears had been expressed in understanding spreadsheets and many secretaries experienced anxieties relating to their own self confidence and ability. This was not stereotyped with age. Problems of isolation and social support were also expressed. 6. This company was particularly interested in the training needs of the managers with respect to IT. 7. They identified the following areas to be important to managers: - computer literacy - technology - human implications of IT - an appreciation of the fully automated office. 8. Joint training sessions were arranged in-house with secretaries and their managers. 9. The company were interested in collaboration over any future training material. In particular they would be interested in material relating to the principles of IT and on basic supervisory management skills.

Telephone Interviews

The following sample of local organisations were contacted by telephone:

1. Averys Ltd
   Smethwick
   Warley
   West Midlands

2. Building
   Society

3. County Council

4. Barclays Bank
   Leicester

5. Fisons
   Fison House
   Princes Street
   Ipswich
   Suffolk

6. NATWEST
   Computer Centre
   Packington Hill
   Kegworth
   Derby

7. Walkers Crisps
   Feature Road
   Thurmaston
   Leicester

8. Charnos Ltd
   Corporation Road
   Ilkeston
   Derbys

Telephone Interviews Cont'd

9. Mr P Gibson
Cenral TV
TV Studios
Birmingham

10. Leicester Mercury Ltd
PO Box 46
St George Street
Leicester

11. Armitage Shanks
Armitage
Rugeley
Staffs

12. Showboat Holdings Ltd
Loughborough

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FURTHER EDUCATION UNIT

Elizabeth House York Road London SE1 7PH Telephone 01-928-9222 ext

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Chief Officer Jack Mansell MEd CEng FIEE MIMech E

PROJECT INFORMATION BULLETIN

Title:	Stress Management in the Modern Office: Needs Analysis (RP270/PICKUP*)
Starting Date:	November 1984
Completion Date:	April 1985
Aims of Project:	To identify the training needs arising from the modernisation of the office environment, and the consequent stresses on staff created both by the process of change and the new work environment.
Background:	Work in the modern office is increasingly focussed on the use of new technology. Information technology is continuing to bring about significant changes in the office environment in which an increasing proportion of the UK workforce is employed. In some cases, the adoption of new technology has been accompanied by low job satisfaction and high wastage rates, and these negative aspects have not always been offset by overall improvements in performance. One possible reason for these failings is the lack of attention to the management of the stresses that the changing office causes for staff.
Method:	i) A comprehensive literature review will be undertaken in order to identify the nature of changes in the office environment, and the ways in which organisations have adapted to new office technology. ii) Working contact will be established with local organisations spanning a range of industrial, commercial and administrative activities in order to identify their perceived training needs in this area. The Institute of Qualified Personal Secretaries and the Institute of Administrative Management will also be asked to supply evidence and to recommend appropriate organisations from which relevant data may be obtained. iii) An analysis will be carried out of the perceived problems and needs and these will be translated into training/education requirements.

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iv) Existing courses dealing with social and clerical skills for office workers will also be reviewed in order to establish the degree to which they relate to the stress management training needs which have been identified.

Outcomes: A report suitable for consideration for publication by FEU which will :

i) identify the nature of the changing office environment;
ii) identify the training needs associated with stresses caused by these changes, and specify related training objectives;
iii) make recommendations on any development work which will be necessary to design training activities and learning materials which will meet the needs identified.

Research Director: Mrs Sue Cox, Tutor, Centre for Extension Studies, Loughborough University of Technology.

FEU Contacts: Peter Davies/Jack Mansell
Ronald Arnfield, PICKUP Regional Development Agent, East Midlands.

The Further Education Unit was established as a focal point for further education curricular matters and as a centre which would make possible a more co-ordinated approach to FE curriculum development. It aims to promote, encourage and develop the efficient provision of further education in the United Kingdom by:-

a) reviewing and evaluating the range of existing curricula and programmes;
b) determining priorities and recommending improvements;
c) carrying out curriculum studies, development and evaluation;
d) disseminating FE curriculum information.

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*PICKUP (Professional, Industrial and Commercial Up-dating) is the name of the DES initiative designed to follow up its discussion paper Continuing Education (October 1980) and the responses to it. Further details about the FEU's involvement with PICKUP are available on request.

(PD/JWM/November 1984)

APPENDIX IV

IQPS Questionnaire

Sample Data from 26 Returns

IQPS QUESTIONNAIRE

IMPACT OF TECHNOLOGY IN THE MODERN OFFICE

TRAINING NEEDS ANALYSIS

1. NATURE OF ORGANISATION

Please state: (a) nature of business .....
(e.g. banking, pharmaceuticals, engineering etc)

(b) office/department in which you work .....
(e.g. finance, administration, personnel etc)

(c) number of people in that department .....
(i.e. size)

(d) approximately how many are

	men	women
clerical/secretarial		
secretarial/supervisory		
lower/middle management		
senior management		

2. CHANGES

Has any new technology been introduced into your office or department in the last year (e.g. computers, word processors, electronic typewriters, spread sheets, electronic mailing, data bases etc).

(Please tick the appropriate box) YES ☐ NO ☐

If YES please briefly describe the nature of the new technology introduced .....

.....

.....

How many people did it directly effect? .....

Who were they? (please indicate using grid)

	men	women
clerical/secretarial		
secretarial/supervisory		
L/M Manag[t]		
Senior Manag[t]		

3. EFFECTS OF CHANGES

(i) **Would you say that these changes:**

(please tick as appropriate)

(a) increase skills required? **(b)** no change in skills required? **(c)** decreased skills required?

cont.....

3(i) contd.

if **(a)** or **(c)** please say in what way skill requirement changed .....

.....

..... (what was lost or had to be gained)

(ii) Would you say that these changes:

(please tick as appropriate)

(a) required less knowledge | **(b)** no change in knowledge | **(c)** required new knowledge

if **(a)** or **(c)** please indicate what new knowledge was required .....

.....

(e.g. word processing, data processing)

(iii) Would you say that these changes:

(please tick as appropriate)

(a) made work more satisfying | **(b)** no change in satisfaction | **(c)** made work less satisfying

(iv) Would you say that they involved:

(please tick as appropriate)

(a) more interaction with colleagues | **(b)** no change in in interaction | **(c)** less interaction with colleagues

(v) Generally, how many of the people involved:

(please tick as appropriate)

	Welcomed the changes, viewing them as challenging		Expressed no obvious feelings (indifferent)		Worried about the changes, showed anxiety at having to cope with them	
	men	women	men	women	men	women
clerical/secretarial						
secretarial/supervisory						
lower/middle management						
senior management						

4. MANAGING THE CHANGE

1. When the new technology was introduced, were the people involved:

	YES	NO
Fully informed beforehand	☐	☐
Consulted as to how it should be introduced	☐	☐

cont.....

Given some informal instruction on use	☐	☐
Given formal training on use	☐	☐
Asked afterwards how they were coping with it	☐	☐

TRAINING SCHEDULE

1. If training was given please describe briefly .....

.....

.....

.....

2. Was this done: **(a)** formally informally

(b) by the Co. by outside trainers

(Please tick as appropriate)

for **(b)** state briefly, who .....

3. **Was the training given:**

	YES	NO
(a) necessary	☐	☐
(b) effective	☐	☐
(c) adequate to meet all your needs	☐	☐

Please consider the following list and tick the items which describe the training needs relevant to your job

(a) general knowledge of new office systems (e.g. how computers work)

(b) how to cope with change and stress

(c) new social skills (eg. improved communication skills)

(d) new technical skills (eg. appreciation of data processing)

(e) new management skills

(f) others (please specify) .....

.....

.....

Thank you for your cooperation

SAMPLE DATA

	Nature of Organisation	Changes	What the changes involved
1.	National Health Service	Electronic typewriter	Increase skills, new knowledge, more interaction with colleagues. Made work more satisfying.
2.	Accountancy	Electronic typewriters, facsimilie, data base, mini and microcomputers	Increase skills, required less knowledge, more interaction with colleagues. Made work more satisfying.
3.	Engineering	None	None
4.	Health Service	Word processor and micro-computer	Increase skills, new knowledge, made work more satisfying. No change in interaction.
5.	Textiles, chemical engineering	New telex system on an international basis.	Increase in skills, new knowledge, less interaction with colleagues, work less satisfying.
6.	Computing	Lots of electronic equipment	Increase skills, new knowledge, more interaction with colleagues, work more satisfying.
7.	Motor manufacturing	None	None
8.	Brewery	Word processor, electronic typewriter, telephone system	Increase skills, new knowledge, less interaction with colleagues, work more satisfying
9.	Maintenance chemicals and equipment	Electronic typewriter	Increase skills, new knowledge, more interaction, work more satisfying
10.	Education (technology)	Microcomputer with word processing software	Increase skills, new knowledge, more interaction, work more satisfying.

	Nature of Organisation	Changes	What the changes involved
11.	Haulage, vehicle maintenance	None	None
12.	Education (university)	Word processor, electronic typewriter	No change in skills, new knowledge, more interaction with colleagues, work more satisfying
13.	Banking	Electronic typewriter, terminal systems	No change in skills, new knowledge, work more satisfying, no change in interaction
14.	Manufacturers of copper/brass wire, rod etc.	Computer system, electronic typewriter	No change in skills, new knowledge, work more satisfying, less interaction
15.	National Health Service	Database, word processor	Increase skills, new knowledge, work less satisfying, less interaction.
16.	Engineering	Word processing, database, electronic typewriter	Increase skills, new knowledge, work more satisfying, no change in interaction
17.	Manufacturing	Computer	No change in knowledge, no change in skills, no change in satisfaction less interaction
18.	Construction	Computer, electronic typewriter	No change in skills, no change in interaction, new knowledge
19.	Boots Co. Ltd.	Word processors, computer	No change in skills, new knowledge, work more satisfying, more interaction with colleagues
20.	Engineering	None	None

	Nature of Organisation	Changes	What the changes involved
21.	Manfacturers of heavy mining machinery	None	None
22.	Research and Development Association	Electronic typewriter, photocopier	Increase skills, no change in knowledge, no change in satisfaction, no change in interaction
23.	Accountancy	Computer	Increase skills, new knowledge, no change in satisfaction, more interaction
24.	Engineering	Word processor	Increase skills, new knowledge, work more satisfying, more interaction
25.	Local Government	Computer linked word processor, electronic typewriter with VDU	Increase skills, new knowledge, electronic typewriter made work more satisfying
26.	Local Government	6 computer terminals	Increase in skills, new knowledge, work more satisfying, no change in interaction

(to be continued)

How was the change managed?

1. People involved were fully informed beforehand, consulted as to how it should be introduced, given informal instructions and were asked how they were coping with it.

2. People involved were fully informed beforehand, consulted as to how it should be introduced, given informal instructions and formal training and were asked how they were coping with it.

3. None.

4. They were given informal instruction. Not informed beforehand, not consulted on how it should be given, no formal training nor asked how they were coping with it.

5. Given informal instruction on use and were asked how they were coping with it. Not informed beforehand, nor consulted on how they were coping with it.

6. People involved were fully informed beforehand, consulted as to how it should be introduced, given informal instructions and formal training and were asked how they were coping with it.

7. None.

8. People involved were fully informed beforehand, consulted as to how it should be introduced, were given formal training and were asked how they were coping with it.

9. They were fully informed beforehand, given informal instructions and formal training.

10. Given informal instructions, not involved beforehand, etc.

How was the change managed?

11. None.

12. People involved were fully informed beforehand, consulted as to how it should be introduced, and were asked how they were coping with it.

13. People involved were fully informed beforehand, given formal training and were asked how they were coping with it.

14. People involved were consulted as to how it should be introduced, were given formal training and informal instructions.

15. People involved were given some informal instructions, not involved beforehand.

16. People involved were given some informal instructions, not involved beforehand.

17. People involved were fully informed beforehand, consulted as to how it should be introduced, given informal instructions and formal training.

18. People involved were fully informed beforehand, consulted as to how it should be introduced, and were asked how they were coping with it.

19. People involved were fully informed beforehand, consulted as to how it should be introduced, given informal instructions, formal training and were asked how they were coping with it, but no reference was made about eye strain etc.

20. None.

How was the change managed?

21. None.

22. When the new technology was introduced the people involved were not approached, but were left to get on with it.

23. People involved were given formal training and were asked how they were coping with it.

24. People involved were fully informed beforehand, consulted as to how it should be introduced, given informal instructions and formal training.

25. Electronic Typewriter - people were fully informed beforehand, given some informal instructions and were asked how they were coping with it.

    Word Processor - people were fully informed beforehand, were consulted as to how it should be introduced, given some formal training on use and were asked how they were coping with it.

26. People were fully informed beforehand, consulted as to how it should be introduced, given some informal instructions and formal training and were asked how they were coping with it.

What training was given and how?

1. Suppliers gave a brief demonstration on delivery, but returned a week later to give a more detailed demonstration. The training was necessary, effective and adequate.

2. Own training department and outside specialists gave formal training. This was necessary, effective and adequate.

3. None.

4. One person was given formal instruction, the rest were given informal instruction by the Company. The training was effective and necessary but not adequate.

5. Informal training was given from an outside company. The training was necessary.

6. Informal training given by a member of staff already familiar with equipment, most staff train themselves by reading manuals. Training given is necessary, effective and adequate.

7. None.

8. External training by suppliers. The training given was necessary, effective and adequate.

9. Were given formal training by the representative of the typewriter's company. Training was effective, necessary and adeauate.

10. One person fully instructed by manufacturers, this person then informally trained others.

What training was given and how?

11. None.

12. Two day modules at a training centre. The training was necessary, effective and adequate.

13. Formal training was given by the Company, it consisted of a 3 day training course at Head Office for secretarial and supervisory staff members. Also had an in-branch trainer for first two weeks on the new system. This was necessary, effective and adequate.

14. Training was given as part of a package offered by IBM. Training was given by both the Company and outside trainers and was informally and formally done. This was necessary and effective.

15. Training consisted of giving the bare facts and only being informed of details at the time they were required. This was done by the Company and it was necessary.

16. Initially girls were placed in front of machine and told to get on with it, but this caused much distress. Later the Company included an informal training programme. This was necessary and effective.

17. Informal training included weekly sessions experimenting on a computer terminal and discussing its different functions and any problems. This was necessary and effective.

18. Training was done informally by the Company's Data Processing Department. Training given was necessary.

19. Informal training was given by the Company; it consisted of working through 3 word processor manuals with assistance available if needed. Training was necessary, effective and adequate.

20. None.

What training was given and how?

21. None.

22. No training was given.

23. Training was given informally by outside trainers, this was necessary and effective.

24. Only 2 members of staff were given formal training, remainder of staff were given 'on the job' informal training by the 2 staff formally trained. Training was necessary and effective.

25. Electronic typewriter - 6 afternoon sessions were given by outside trainers, plus one day away from office training. Several manuals were also supplied.

Word Processor - informal training was given by the Company.

The training given was necessary, effective and adequate.

26. Training was given informally by the Company; this was necessary, effective and adequate.

FEU

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